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ABSTRACT

The design and outcome of a bilingual education program evaluation emphasizing the instructional and attitudinal variables of the bilingual education program presently in operation is described. The purpose of this program evaluation emphasizing needs assessment is to gather base-line data for continued evaluations in the following years. The instruments and procedures are being refined for a follow up evaluation in the Spring of 1977. Other bilingual education programs can adapt this design to their needs. (Author/RC)

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EVALUATION DESIGN AND IMPLEMENTATION OF A BILINGUAL EDUCATION PROGRAM, GRADES 1-12. SPANISH/ENGLISH

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The school district which conducted this bilingual education program evaluation is located in the Southeast sector of Pennsylvania about ninety miles Southwest of Philadelphia. Industry of the city is farm related, light industry, and tourism. Figure 1, Evaluation Design and Testing Time Guide Line, outlines the months in 1976, the tasks, and the goals of the evaluation.

About two thousand Spanish speaking Puerto Rican pupils attend elementary and secondary schools within the school district. However, because of the transitional bilingual education model used, only about two hundred of these pupils are actually in the bilingual education program. The other students having been placed within the regular school program are given supplemental studies in English language, Puerto Rican culture, and Spanish language. Although the other two bilingual education models of instruction have been attempted in the school district, the dominant language approach and the English as a second language approach, neither has had as much parental support or success as the transitional approach.

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The Need for the Evaluation

With the kind of financial investment from a school district required to implement an innovative program of bilingual education, an evaluation design which will permit yearly on-going evaluation of the components of the bilingual education program is needed along with an on-going needs assessment. Bilingual education programs have undergone modification in order to meet the changing needs of participating students: changes in program activities, instructional methods, teaching procedures, curriculum, learning settings, and classroom management. This evaluation design provides for a formative, systematic evaluation design which is intended to provide base-line data to be used for the formulation of guidelines for program planning, modifications, and improvement in years to come.

The Purpose of Evaluation

The purpose of this bilingual education evaluation can be summarized as follows:

1. to acquire evidence to improve learning and teaching.
2. to collect information systematically to determine whether educational changes are taking place on the students.
3. to determine which instructional elements, curriculum components, learning settings, and program activities have the greatest positive influence on learning.
4. to assess student progress in order to prescribe alternatives which might be needed for learning development.

5. to assess the degree of discrepancy between learning objectives and performance.
6. to evaluate the products of the program, the processes or activities leading to the products, and the conditions needed to sustain the educational service.
7. to perform the evaluation tasks detailed in this evaluation design.
8. to set in motion a system of program evaluation which can be carried on by personnel from the school district bilingual education program and administrators.

Evaluation Design and Data Collection Procedures

The evaluation design has been developed in consideration of the goals outlined by the school district and the federal guidelines. An evaluation task has been identified to measure the attainment of each goal.

Specific Tasks and Goals of the Evaluation Design

In order to evaluate the seven goals of the instructional component of the bilingual education program, seven specific tasks were performed:

Task 1 (Goal 1): Measure of listening, speaking, and writing ability in L1 (Spanish) and L2 (English).

Task 2 (Goal 2): Measure of achievement in reading of L1 (Spanish) and L2 (English).

Task 3 (Goal 3): Measure of achievement in subject areas (science, social studies, and math) in L1 (Spanish) and L2 (English).

Task 4 (Goal 4): Measure of knowledge and appreciation of cultural heritage of L1 (Spanish) and L2 (English) speaking communities.

Task 5 (Goal 5): Measure of attitudes toward self, school, home, community.

Task 6 (Goal 6): Measure classroom environment and classroom teaching.

Task 7 (Goal 7): Measure attitudes of parents, teachers, and administrators.

Task 1, Goal 1: Measure of Aural-Oral Language Ability, Spanish and English

The purpose of Task 1 is to obtain and to use measures of oral English and Spanish language ability, listening and speaking, which will be used to categorize a child along the dimension of language dominance. Over a period of time, as children are measured with these instruments, normative data will be obtained to establish language dominance. Language dominance indicates a profile of language development, listening, speaking, reading, and writing, in L2 (English) which is possible for a child with a measurable level of language development in listening, speaking, reading, and writing, in his L1 (Spanish).

The following chart summarizes the long-range program criterion-levels of expectation:

Distribution of Language Instruction and Expected Levels of Accuracy

Time Allotment by Language of Instruction	Number of Years in Program 1 Year	2 Years	3 Years
Dominant Language (L1, Spanish)	70%	60%	50%
Second Language (L2, English)	30%	40%	50%
Level of Accuracy			
Dominant Language (L1, Spanish)	50-60%	60-70%	70-80%
Second Language (L2, English)	20-40%	30-50%	40-60%

Task 2, Goal 2: Measure of Reading Achievement, Spanish and English

The purpose of Task 2 is to assess the child's ability to read in his native language (Spanish) as well as in the second language (English). Scores on the reading tests may be used as measures of achievement in reading and as bases for estimating ability to achievement in subject areas. The reading scores can also be used to group children and in adjusting instruction to individual differences.

Task 3, Goal 3: Measure of Achievement in Subject Matter (Science, Social Studies, and Math)

The purpose of this task is to determine the concept attainment of children in three subject areas: social studies, mathematics, and science in two languages. The major goal of bilingual education is to keep bilingual children on a par with monolingual children in concept attainment in the school curriculum. Little is known about the storage and retrieval of subject matter concepts in two languages. Better knowledge of the way children learn and store subject matter concepts would help determine when a child is ready to enter the regular subject areas in English or to remain in bilingual subject matter classes.

Task 4, Goal 4: Measure of Knowledge of Puerto Rican Cultures, Spanish and English

The purpose of Task 4 is to measure a child's knowledge of the culture of the L1 (Puerto Rican) language community. A bilingual child should have some knowledge of the culture of his first-language speech community. The Puerto Rican child is likely to shift from the Mainland culture to the Island culture in just a few hours.

Task 5, Goal 5: Measure of Attitudes Toward Self, School, Family, and Community

The purpose of this task is to measure the pupil's attitude toward self and environment. If an environment or self-image is not gratifying, it is not likely that positive learning will result.

Task 6, Goal 6: Measure Classroom Environment and Classroom Teaching

The purpose of this task is to measure classroom environment as established by the teacher and to measure classroom teaching. The classroom environment should be open and psychologically comfortable for the student. Students and teacher should show mutual respect and listen and respond carefully and sensitively to one another. Classroom teaching should be planned to meet measurable objectives. It should provide instruction in both languages and provide for individual learning abilities and styles of pupils.

Task 7, Goal 7: Measure Attitudes of Parents, Teachers, and Administrators

The purpose of this task is to measure the attitudes toward bilingual education of parents of children in the bilingual education program, the attitudes toward bilingual education of teachers who teach in the bilingual education program, and the attitudes toward bilingual education of administrators of bilingual education programs. Attitudes of the three adult groups should be supportive.

A summary of instruments used in this evaluation and needs assessment is to be found in Figure 2.

This report will focus upon task and goals 1, 2, 3, 4, and 5 which primarily cover the instructional component and the attitudinal component of the bilingual education program.

The intent of this report is to lay out the evaluation design, its implementation problems, and to summarize the normative data obtained. Growth data obtained through pretest-posttest, programatic evaluation will have to await the 1977 test data.

Instructional Variables Tested in Spanish and English

Three large categories of instructional variables were tested in this study: (1) language dominance (Spanish and English) variables. (2) subject matter concept attainment variables, and (3) Puerto Rican culture variables.

Variables composing the language dominance category are: (1) reading in English, (2) reading in Spanish, (3) aural/oral comprehension in English, (4) aural/oral comprehension in Spanish, (5) writing in English, and (6) writing in Spanish. Reading in English and Spanish is composed of four sub-factors: (1) reading vocabulary, (2) reading speed, (3) reading comprehension, and (4) a total means of reading vocabulary, speed, and comprehension.

Variables composing the subject matter concept attainment category are: (1) social studies, (2) science, and (3) mathematics. Mathematics was tested, grades 1-6, Science and Social Studies concepts were tested grades 4-12. The science and social studies tests were bilingual and criterion-referenced to the school curriculum, the math tests were norm-referenced.

A third instructional category tested was Puerto Rican culture. This test was bilingual, criterion-referenced to Puerto Rican children living in the Northeastern section of the mainland. A shortened version was

presented to primary, grades 1-3, children, an advanced version was given to students, grades 4-12. The tests are bilingual.

In the following sections each instructional category and its constituent variables and factors will be discussed.

Language Dominance

Language dominance is a way of describing the level of accuracy in the first language and the second language which a bilingual student has as he goes from level to level in a transitional bilingual education program. Level I includes grades 1-3, level II includes grades 4-6, level III includes grades 7-9, and level IV includes grades 10-12. Once a bilingual pupil attains a level of accuracy in the second language equivalent to 40-60% for his instructional level, he is ready to make the transition into the regular school program, given some time and assistance in making this difficult linguistic and cultural transition. During this transition, the bilingual student's level of accuracy should be brought up to 70-80% of his instructional level. The three variables which make-up a language dominance category in both the first language (L1) and the second language (L2) are: listening/speaking (aural-oral comprehension), reading, and writing.

The teacher who is evaluating a student's language dominance in aural-oral comprehension, reading, and writing in English, should be certain that the child has reached and is maintaining a 40-60% level of accuracy before recommending that the child start the transition to the regular school program. It is recommended that this transition take place over a period of time, not as an isolated case, but as anticipated social behavior and educational progress. The data provided in Tables 1-8 of

this study provide some of the necessary information for making judgements concerning levels of accuracy and language dominance in Spanish and English.

Reading, Level I, Grades 1-3. The English language reading test and the Spanish language reading tests are intended for level I difficulty and have the same number of items for each skill section. Table 1 indicates that Reading, Total Means, English is larger than Reading, Total Mean, Spanish, the difference being significant at the .05 level.

Spanish speaking children entering the bilingual education program, grades 1-3, are being taught and are learning to read in both Spanish and English, but as a group they tend to read significantly better in English than in Spanish. At the primary level, grades 1-3, children perceive the need to learn to read in English and this need makes itself apparent in their reading achievement in English. It is not to be ignored that they are, indeed, also learning to read in Spanish.

Table 5 indicates the high correlation between reading ability in Spanish and reading ability in English. The Spanish speaking child who enters the bilingual education program at the beginninf of the first grade will be instructed in Spanish reading for about four to six weeks before English reading instruction is started. From that time on through the primary program reading instruction in Spanish and English progress simultaneously with gradually less time given to Spanish reading and more time given to English reading so that by the third grade at least 70% of reading instruction time is in English.

Reading, Level II, Grades 4-6. The English language reading test and the Spanish language reading test for level II, grades 4-6, are parallel and have the same number of items for each skill section. Reading, Total Means, English, is larger than Reading, Total Means, Spanish. This

is a significant difference at the .01 level. Bilingual, Puerto Rican children in the bilingual education program are learning to read English with more skill than they are learning to read Spanish. They are, however, reading in both languages.

By the time a Spanish speaking, Puerto Rican, bilingual child enters the fourth grade of the Bilingual Education Program, formal instruction in Spanish reading no longer exists except to a slight extent. At least 70% of the bilingual child's reading instruction is in English. There are, however, opportunities for the child to read subject matter independently or with the aide in Spanish. Spanish is deceiving in that it is possible to read the words with a great deal of success, but the data in Table 2 indicates that children are not so strong in Spanish comprehension as they are in English comprehension. Table 5 indicates the high correlation between Spanish and English reading variables.

Reading, Level III, Grades 7-9. The English language reading test and the Spanish language reading test for level III, grades 7-9, are parallel and have the same number of items for each skill section. Reading, Total Means, English, is smaller than variable 8, Reading, Total Means, Spanish. This difference is significant at the .05 level in favor of Spanish reading.

These students are definitely learning to read English; however, they are relatively new to the bilingual education program and have had at least 95% of their elementary school education in Spanish while in Puerto Rico. This information is also helpful in indicating the importance of bilingual education at the junior high level where entering Spanish dominant students must learn to read in English as well as to obtain their

subject matter in Spanish and English so that normal progress can be made during the junior high years. Table 7 indicates the high correlation between reading ability in Spanish and reading ability in English.

Reading, Level IV, Grades 10-12. The English language reading test and the Spanish language reading test for level IV, grades 10-12, are parallel and have the same number of items for each skill section. Reading, Total Means, English, is smaller than Reading, Total Means, Spanish. This difference is significant at the .05 level in favor of Spanish reading.

One fact becomes outstanding in comparing reading ability in Spanish and English, levels I, II, III, and IV. For levels I and II, English reading ability is significantly better than Spanish reading ability, for levels III and IV, Spanish reading is significantly better than English reading ability. Children who enter the bilingual education program in the elementary school grades have a better chance of becoming better English readers than Spanish readers, even though they are learning to read in both languages. Students who enter the bilingual education program after elementary school will tend to remain better Spanish readers than Englisn readers even though they do read in both languages. Table 10 indicates the significant correlations between Spanish reading.

Aural-Oral Comprehension, Level I, Grades 1-3. Table 1 indicates that the mean difference of aural-oral (listening-speaking) language ability of bilingual children, grades 1-3, between English and Spanish is significantly greater for Spanish than English at the .01 level, on a 1-6 point scale, using Foreign Service Institute criteria. This difference is not surprising since children enter this level of the bilingual education

program speaking virtually no English at all. Table 5, Aural-Oral Comprehension, Spanish, correlates significantly, at the .05 level, Reading, Total Means, Spanish.

Aural-Oral Comprehension, Level II, Grades 4-6. Table 2 indicates that the aural-oral (listening-speaking) language ability of bilingual children, grades 4-6, is significantly greater for Spanish than English at the .01 level. Table 6 indicates a significant correlation between Aural-Oral Comprehension, English, with Writing, English and Writing, Spanish. Aural-Oral Comprehension, Spanish, correlates significantly with Writing, Spanish.

Aural-Oral Comprehension, Level III, Grades 7-9. Table 3 indicates that the aural-oral (listening-speaking) language ability of bilingual students, grades 7-9, is significantly greater for Spanish than for English at the .01 level. In comparing Tables 1 and 2 with Table 3, a gradual gain can be seen through the elementary and junior high school years in English language aural-oral language ability; whereas, Spanish aural-oral language ability remains quite fixed at a point between 3 and 4 on a 1-6 scale. The gain in English aural-oral ability from level I to level III is significant at the .01 level.

Table 9 indicates a significant correlation between Aural-Oral Comprehension, Spanish, Reading Comprehension, English, Reading, Total Means, English; Reading Comprehension, Spanish, and Reading, Total Means, Spanish. The interesting factor here is that aural-oral language ability in one language correlated highly with reading comprehension and general reading ability in that language. Table 6 also indicated aural-oral language ability in one language correlated highly with writing ability in that language.

Aural-Oral Comprehension, Level IV, Grades 10-12. Table 4 indicates that the aural-oral (listening-speaking) language ability of bilingual students, grades 7-9, is significantly greater for Spanish than for English at the .01 level. In comparing Tables 1, 2, and 3 with Table 4, a general gain can be seen through the elementary and high school years in English language aural-oral language ability; whereas, Spanish aural-oral language ability remains rather fixed at a point between 3 and 4 on a 1-6 scale.

Table 8 shows a significant correlation between Aural-Oral Comprehension, Spanish, Reading Comprehension, Spanish, and Reading, Total Means, Spanish. The fact that aural-oral comprehension in a language correlates with reading comprehension in the language pervades this aspect of the Language Dominance data and needs careful implementation in the classroom.

Writing, Level I, Grades 1-3. In the writing portion of the language dominance cluster, English writing ability is significantly better than Spanish writing at the .01 for grades 1-3, Level I, Table 1, Writing, English, and Writing, Spanish. The reader is reminded that English reading ability also showed itself significantly better than Spanish reading ability at Level I.

Table 5 shows that the only variable to correlate with Writing, English, is Math Computation; the only variable to correlate with Writing, Spanish, is Student Attitude, Community.

Writing, Level II, Grades 4-6. In the writing portion of the language dominance cluster, English writing ability appears to be slightly better than Spanish writing ability, but not at a significant level.

Table 6 indicates some interesting significant correlations of Writing, English and Writing, Spanish with other instructional variables. Writing, English, correlates with Reading Comprehension, Spanish; Aural-Oral Comprehension; Writing, Spanish; and Science. Writing, Spanish, correlates with Aural-Oral Comprehension, English; Aural-Oral Comprehension, Spanish; Social Studies; and Science. The child who is writing and writing well in Spanish and English tends to do better on aural-oral comprehension, reading comprehension, science, and social studies.

Writing, Level III, Grades 7-9. In the writing portion of the language dominance cluster, Spanish writing ability is significantly better than English writing at the .05 level. The reader is again reminded that Spanish reading is better than English reading at this level. Bilingual students entering the bilingual education program at this level have undergone most of their elementary education in Spanish while living in Puerto Rico.

Table 7 shows some interesting correlations between writing variables and other instructional variables. Writing, English, correlates with Reading, Vocabulary, English; Reading, Total Means, English; Writing, Spanish; and Student Attitudes Toward Community. Writing, Spanish, correlates with Reading, Vocabulary, English; Reading Speed, English; Reading, Total Means, English; Science; and Student Attitude Toward Self. Writing ability does seem to affect concept attainment in Science and in Social Studies and is also governed in some way by the student's attitude toward himself.

Writing, Level IV, Grades 10-12. In the writing portion of the language dominance cluster, Spanish writing ability is somewhat better than English writing ability, but there is not a significant difference

between these variables, Table 4. The reader is also reminded that Spanish reading is significantly better than English reading at this level for bilingual students who enter the bilingual program after most of their education has been conducted in the Spanish language.

Table 8 shows some interesting correlations between Writing, English, and other instructional and attitudinal variables. It is also interesting to note at this point that, at the high school level, Writing, Spanish, does not correlate with any instructional or attitudinal variables. Writing, English, correlates with Reading Vocabulary, English; Reading Speed, English; Reading Comprehension, English; Reading Total Means, English; Reading Speed, Spanish; Reading, Total Means, Spanish; Writing, Spanish; Social Studies, Spanish Dominant; Science, Spanish Dominant; Student Attitude Toward Self; Culture.

Writing in English tends to pervade the student success in so many instructional and attitudinal variables that it must be stressed throughout the high school curriculum of bilingual students.

Subject Matter Concept Attainment

One major goal of bilingual education is that children will learn subject matter of the regular school curriculum in two languages, the home language and the school language, until they know the school language well enough to use it for study purposes in the classroom. In this report, three subject areas were tested: (1) mathematics for levels I and II, (2) social studies, levels II, III, and IV, and (3) science, levels II, III, and IV. The mathematics tests were taken from the computation section of the Stanford Achievement Tests. A norm-referenced test was used for this portion of the testing because of the

universality of numbers and mathematics symbols. Teachers read the directions to the children in Spanish. The science and social studies texts were criterion-referenced, the concepts tested taken from the elementary school curriculum guide of the School District. The multiple-choice tests were entirely constructed bilingually, the directions were in Spanish and English and the items were presented in two columns on one page, one column in Spanish, the other in English. The student was permitted to read and answer in either column. In this report, Science and Social Studies, Spanish Dominant or English dominant, refers to students who answered these tests on the Spanish or the English side. The word dominant is deceptive, since the language dominance portion of this study has indicated that although these pupils all speak Spanish better than English, many of them read and write English better than Spanish. The same science and social studies test was given to levels II, III, and IV.

Mathematics, Level I, Grades 1-3. Table 1 indicates that the grade level equivalence of bilingual children at this level is 2.2 which is an adequate level since it averages the scores of first, second, and third graders. Because of the universality of the language of mathematics, bilingual pupils are rewarded with better success in mathematics and devote large amounts of time to mathematics study. Considering the time devoted to mathematics study, the outcomes, though good, are not exceptional.

Table 6 indicates that for Mathematics Computation, Raw Score, there are the following significant correlations: Reading, Total Means, English; Reading Vocabulary, Spanish; Writing, English; Mathematics, Grade Level; Student Attitude, School; and Culture.

Mathematics, Level II, Grades 4-6. Table 2, Math Computation, Raw Score and Math Computation, Grade Level Equivalent, indicate math progress for bilingual children. Math Computation, Grade Level Equivalent, shows that for the ten students tested, they have a mean grade level equivalent of 4.2 for a mixed group of fourth, fifth, and sixth graders. About half of the group tested had a fourth grade age equivalency. More attention to testing mathematics achievement, levels I, II, III, and IV, should be given bilingual pupils since a large portion of their instructional time is devoted to mathematics study.

Table 6 shows that Math Computation, Raw Score, correlates significantly with Reading Comprehension, Spanish; Math Computation, Grade Level; Culture. Mathematics, Grade Level, correlates significantly with Reading Comprehension, Spanish.

Social Studies, Level II, Grades 4-6. The social studies test items were taken from the curriculum guide, grades 4-6, for the School District. The test was presented bilingually, the pages divided in two with the Spanish version of the test in one column and the English version in the other. The child could read and answer the questions on either language side since the object of this test is not to test reading or language ability, but to test concept attainment in social studies. What is called Spanish dominant or English dominant refers to the language side of the page on which the student marked his or her answers, assuming that the student answered the questions on the language side of the paper which he or she read the item.

Table 2 indicates that all of the children at level II, Grades 4-6, responded to the questions on the Spanish side. Their mean score indicates a 40% level of accuracy.

Table 6 indicates that Social Studies correlate significantly with Aural-Oral Comprehension, English, and Writing, Spanish.

Social Studies, Level III, Grades 7-9. The social studies test for level III, Grades 7-9, was the same used for level II and level IV.

Table 3 indicates that at the junior high school level, grades 7-9, bilingual students are at about the 60% level of accuracy on level II, grades 4-6 social studies concept attainment items. Table 3 also indicates that the level III students have made a significant gain over the level II students on the same social studies items. Also, half the students at this level are Spanish dominant and half are English dominant in answering the social studies questions; however, the difference between the social studies scores of the Spanish dominant and English dominant students is not significant.

Table 6 indicates that the junior high school, level III, grades 7-9, Social Studies correlates significantly with Culture.

Social Studies, Level IV, Grades 10-12. The social studies test for level IV, Grades 10-12, was the same used for levels II and III.

Table 4 indicates that the high school level, grades 10-12, bilingual students are at about the 68% level of accuracy on level II, grades 4-6, social studies concept attainment items. Table 4 also indicates that level IV students have made a nonsignificant gain over the level III students on the same social studies items. Only 4 out of the nineteen high school students are English dominant. The slightly better score of the English dominant students over the Spanish dominant high school students is nonsignificant.

Table 6 indicates that Social Studies correlates significantly with Reading, English and Spanish, Writing, English, Science, and Student Attitude Toward School. There is no correlation between Social Studies and Culture at the high school level.

Science, Level II, Grades 4-6. The science test items were taken from the curriculum guide, grades 4-6, for the school district. The test was presented bilingually, the pages divided in two with the Spanish version of the test in one column and the English version in the other. The child could read and answer the questions on either language side since the object of this test is not to test reading or language ability but to test concept attainment in science. What is called Spanish dominant or English dominant refers to the language side of the page on which the students marked his or her answers, assuming that the student answered the questions on the language side of the page on which he or she read the item.

Table 2 indicates that all of the children responded to the items on the Spanish side of the page and could be called Spanish dominant for this activity. Their mean score on the science test indicates a 43% level of accuracy.

Table 6 indicates that Science correlates significantly with Aural-Oral Comprehension, Spanish; Writing, English; Writing, Spanish; and Social Studies. Science also correlates with Student Attitude, Family, and Student Attitude, Mean.

Science, Level III, Grades 7-9. The science test for level III, Grades 7-9, was the same used for levels II and IV.

Table 3 indicates that at the junior high school level, grades 7-9, bilingual students are at about the 46% level of accuracy on level II,

grade 4-6 science concepts attainment items. Table 3 also indicates that the mean score for Science, Spanish Dominant, students is significantly lower than the mean of Science, All, students. A comparison of Table 2 and Table 3 indicates that between levels II and III, there is no significant increase in science concept attainment for all students at each level taking the test.

Table 7 indicates a significant correlation between the Science and Writing, Spanish.

Science, Level IV, Grades 10-12. The science test for level IV, grades 10-12, was the same used for levels II and III.

Table 4 indicates that bilingual, high school students, grades 10-12, are at about the 67% level of accuracy on level II, grades 4-6, science concept attainment items, a significant gain over level II and level III on the same science achievement test, but not reaching the 70% criterion level of accuracy.

Table 10 indicates that science correlates significantly with Reading in English, and in Spanish, Writing in English, Social Studies, and Student Attitude, Self and School.

Puerto Rican Culture, Level I, Grades 1-3. The Puerto Rican, Spanish speaking children, grades 1-3, in the bilingual education program took a fifteen item, Puerto Rican culture test presented in Spanish in one column of the page and English in the other column. The child could read and answer the test items on either column. If the child answered in the Spanish column, he or she was considered to be Spanish dominant for culture items; if the child answered in the English column, the child was considered to be English dominant for culture items. The fifteen

items were simplified from the advanced culture test and considered to be appropriate for level I Puerto Rican children by Puerto Rican informants.

Table 1 indicates that all 55 of the primary grade children who took this test were Spanish dominant for cultural items. They also attained a 58% level of accuracy on this test.

Table 5 indicates that the culture variables correlate significantly with reading comprehension in English, reading vocabulary in English, reading total in English, and reading vocabulary in Spanish. It appears that even though these students tend to be Spanish dominant in answering these cultural questions, they are learning about their culture by reading in English.

Table 6 indicates that the culture variables also correlate significantly with mathematics computation and with students' attitude toward self and school.

Puerto Rican Culture, Level II, Grades 4-6. The Puerto Rican, Spanish speaking children, grades 4-6, in the bilingual education program took a thirty-five item Puerto Rican culture test presented in Spanish in one column of the page and English in the other column. The child could read and answer the test items in either column. If the child answered in the Spanish column, he or she was considered to be Spanish dominant for culture items; if the child answered in the English column, the child was considered to be English dominant for culture items. The thirty-five Puerto Rican culture items were judged to be appropriate for Puerto Rican children by Puerto Rican informants. The same culture test was used for levels II, III, and IV.

Table 2 indicates that all of the twenty-two level II children who took the test were Spanish dominant. They also answered the questions at a 44% level of accuracy.

Table 6 indicates that the cultural variables correlate with reading speed in Spanish and math computation.

Puerto Rican Culture, Level III, Grades 7-9. Table 3 indicates that only three of the twenty-two level II, grades 7-9 students who took the thirty-five item Puerto Rican culture test were English dominant. All of the students answered the questions at a 67% level of accuracy. Table 3 also indicates a significant difference between level II and level III mean scores on the cultural variables.

Table 7 indicates that the cultural variables correlate significantly with reading speed in Spanish, reading comprehension in Spanish, reading total in Spanish, aural-oral comprehension in Spanish, Social Studies, reading vocabulary in English, reading speed in English, reading comprehension in English, and reading total in English. The student who reads and speaks well in Spanish and English tends to do better in the culture variables than does the student with poor reading and aural-oral language skills.

Puerto Rican Culture, Level IV, Grades 10-12. Table 4 indicates that only two of the fifteen level IV, grades 10-12 students who took the thirty-five item Puerto Rican culture test were English dominant. The mean score of all of the students reached a 76% level of accuracy. There was also a significant difference between the mean score of all of the level III and level IV students.

Table 8 indicates that the culture variables correlate significantly with Reading, Total, in Spanish, Reading Speed, Spanish, Reading Comprehension, Spanish, and Writing, English. Reading ability in Spanish could be a good predictor of knowledge of Puerto Rican culture since there is not likely to be much written about Puerto Rican culture in English. However, to express his or her knowledge of the Puerto Rican culture to the Mainland community, the student must be able to speak and write in English.

Summary and Recommendations

This report has described the design and outcome of a bilingual education program evaluation emphasizing the instructional and attitudinal variables of the bilingual education program presently in operation. The purpose of this program evaluation emphasizing needs assessment was to gather base-line data for continued evaluations in following years. The instruments and procedures are being refined for a follow up evaluation in the Spring of 1977. Other bilingual education programs can adapt this design to their needs.

A summary of recommendations resulting from the bilingual education program evaluation and needs assessment follows:

1. Reading activities, levels I, II, III, and IV, should be administered in both English and Spanish to develop skills in reading vocabulary, reading speed, and reading comprehension. Attention to Spanish reading should be given, grades 1-6.

2. Structured listening and speaking activities in Spanish and English accompanied by reading and writing in Spanish and English should be incorporated in the junior and senior high, levels III and IV.
3. Writing activities for bilingual children should begin optimally at level II, grades 4-6, and continue through high school.
4. Use writing in Spanish and English to develop and to explore attitudes, values, and culture.
5. Bilingual, criterion-referenced social studies and science tests should be constructed for levels II, III and IV.
6. At grades 4-6, emphasize Spanish and English aural-oral comprehension and writing with social studies and science concents.
7. At secondary level, emphasize Spanish and English reading and writing skills with social studies and science concepts.
8. At grades 10-12, emphasize culture and attitudes toward self, family, school, and community.
9. English dominant students in social studies and science should be screened for transition to the regular program.
10. Bilingual education teachers should continue to strengthen their knowledge of Puerto Rican and Mainland culture.
11. Students should read, write, and discuss Puerto Rican culture using the Spanish language.
12. Puerto Rican culture should be reflected in all classrooms and should relate back to self-image, family, school, and community.

13. The Puerto Rican community should be brought into the school activities.
14. Activities which develop positive attitudes toward self, family, school, and community should continue grades 1-12, with special emphasis at primary and junior high levels.

Figure 1. Evaluation Design and Testing Time Guide Line

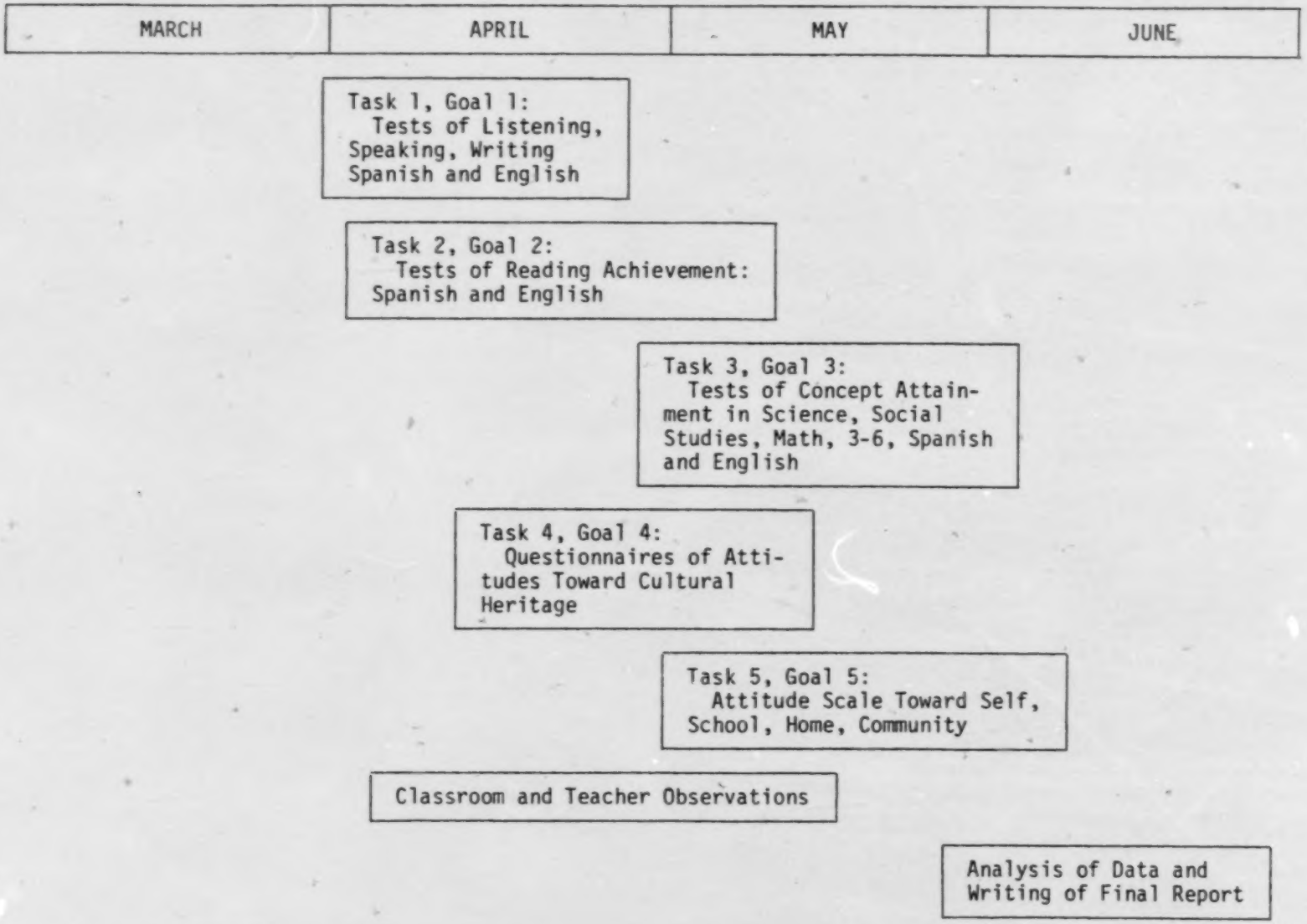
MARCH
APRIL
MAY
JUNE
Task 1, Goal 1:
Tests of Listening, Speaking, Writing Spanish and English
Task 2, Goal 2:
Tests of Reading Achievement: Spanish and English
Task 3, Goal 3:
Tests of Concept Attainment in Science, Social Studies, Math, 3-6, Spanish and English
Task 4, Goal 4:
Questionnaires of Attitudes Toward Cultural Heritage
Task 5, Goal 5:
Attitude Scale Toward Self, School, Home, Community
Classroom and Teacher Observations
Analysis of Data and Writing of Final Report

Figure 2. Summary of Instruments

Goal No.	Description	Instruments	Target Groups	Languages
1	Measure Language Ability	Lancaster/PSU Oral Language and Listening Comprehension Rating Scale	Grades 1-12	English-Spanish
2	Measure of Reading Achievement	Inter-American Series - Prueba de Lectura	Grades 1-12	English-Spanish
3	Measure of Achievement in Subject Areas	(a) Criterion-Referenced Tests from Lancaster Skill Guide, Science and Social Studies: PSU/Lancaster	Grades 4-12	English-Spanish
		(b) Stanford-Achievement Test: Mathematics	Grades 1-8	English
4	Measure of Knowledge of Puerto Rican and Mainland Culture	(a) Cross Cultural Inventory, Primary: PSU/Lancaster	Grades 1-3	English-Spanish
		(b) Cross Cultural Inventory, Advanced: PSU/Lancaster	Grades 4-12	English-Spanish
5	Measure of Attitudes Toward Self, School, Home, and Community	(a) Bilingual Self-Observation Scale, Primary: PSU	Grades 1-3	English-Spanish
		(b) Bilingual Self-Observation Scale, Advanced: PSU	Grades 4-12	English-Spanish
6	Measure Classroom Environment and Teaching	(a) Classroom Environment Scale: Carter, Golub, Barnette	Grades 1-12	English
		(b) Classroom Teaching Scale: Golub, Carter, Barnette	Grades 1-12	English
7	Measure Attitudes of Parents, Teachers, Administrators	(a) Parent Attitude Questionnaire: PSU/Lancaster	Adult	Spanish
		(b) Teacher Attitude Questionnaire: PSU	Adult	English
		(c) Administrator Attitude Questionnaire: PSU	Adult	English

TABLE 1

INSTRUCTION VARIABLES TESTED IN SPANISH AND ENGLISH
Primary: Grades 1-3 (Level I)

Variable Number	Variable Description	Language	Mean	Std. Dev.	No. St.	Comment
1	Reading Comprehension	English	7.7	4.5	43	
2	Reading Speed	English	9.3	4.1	20	
3	Reading Vocabulary	English	14.2	6.5	41	
4	Reading, Total Means	English	31.2*	13.5	43	Sig. Diff. Var. 4/8
5	Reading Comprehension	Spanish	6.0	3.2	34	
6	Reading Speed	Spanish	6.1	3.2	14	
7	Reading Vocabulary	Spanish	14.2	6.9	34	
8	Reading, Total Means	Spanish	26.3*	11.1	34	Sig. Diff. Var. 4/8
9	Aural-Oral Comprehension	English	.8**	.1	57	Sig. Diff. Var. 9/10
10	Aural-Oral Comprehension	Spanish	3.3**	.5	54	Sig. Diff. Var. 4/8
11	Writing	English	2.2**	.5	26	Sig. Diff. Var. 11 & 12
12	Writing	Spanish	1.7**	.8	27	Sig. Diff. Var. 11 & 12
13	Math Computation, Raw Score	English	15.0	8.9	54	
14	Math Grade Level Equivalence	English	2.2	1.0	45	
15	Student Attitudes, Self	English/Spanish	1.3	.2	53	
16	Student Attitudes, Family	English/Spanish	1.3	.2	53	
17	Student Attitudes, School	English/Spanish	1.3	.2	53	
18	Student Attitudes, Community	English/Spanish	1.2	.2	53	
19	Student Attitudes, Total Means	English/Spanish	1.3	.4	53	
20	Culture, Spanish Dominant	English/Spanish	8.7	2.7	55	
21	Culture, All	English/Spanish	8.7	2.7	55	

* $p = < .05$
** $p = < .01$

TABLE 2

INSTRUCTIONAL VARIABLES TESTED IN SPANISH AND ENGLISH
Intermediate: Grades 4-6 (Level II)

Variable Number	Variable Description	Language	Mean	Std. Dev.	No. St.	Comment
1	Reading Vocabulary	English	16.8	7.1	25	
2	Reading Speed	English	9.4	4.7	23	
3	Reading, Comprehension	English	19.6	6.8	25	
4	Reading, Total Means	English	45.8**	18.1	25	Sig. Diff. Var. 4 & 8
5	Reading Vocabulary	Spanish	10.4	3.6	21	
6	Reading Speed	Spanish	6.2	5.4	20	
7	Reading Comprehension	Spanish	12.1	8.2	18	
8	Reading, Total Means	Spanish	28.7**	18.4	21	Sig. Diff. Var. 4 & 8
9	Aural/Oral Comprehension	English	1.4**	.2	26	Sig. Diff. Var. 9 & 10
10	Aural/Oral Comprehension	Spanish	3.8**	.4	26	Sig. Diff. Var. 9 & 10
11	Writing	English	2.8	.7	22	NS, Var. 11 & 12
12	Writing	Spanish	2.6	.9	25	NS, Var. 11 & 12
13	Social Studies, All	Spanish/English	11.7**	3.2	25	Sig. Diff. Var. 13. Levels II & III
14	Social Studies, Span. Dominant	Spanish/English	11.7	3.2	25	
15	Science, All	Spanish/English	10.8	3.9	26	
16	Science, Spanish Dominant	Spanish/English	10.8*	3.9	26	
17	Math Computation, Raw Score	English	14.6	5.2	10	
18	Math Computation, Gd Lvl Eq.	English	4.2	.8	10	
19	Student Attitudes, Self	Spanish/English	3.4	.6	22	NS Var. 19/20, 21, 22, 23 SD, Var. 18, Table 3
20	Student Attitudes, Family	Spanish/English	3.0*	.8	22	
21	Student Attitudes, School	Spanish/English	3.0	.4	22	
22	Student Attitudes, Community	Spanish/English	3.2	.4	22	
23	Student Attitude, Total Means	Spanish/English	3.2	.4	22	
24	Culture, Spanish Dominant	Spanish/English	15.5	5.3	22	
25	Culture, All	Spanish/English	15.5**	5.3	22	Sig. Diff. Var. 25 Level II & Var. 24, Level III

* $p = < .05$
** $p = < .01$

TABLE 3

INSTRUCTIONAL VARIABLES TESTED IN SPANISH AND ENGLISH
Junior High: Grades 7-9 (Level III)

Variable Number	Variable Description	Language	Mean	Std. Dev.	No. St.	Comment
1	Reading Vocabulary	English	10.4	6.3	26	
2	Reading Speed	English	5.8	3.8	26	
3	Reading Comprehension	English	12.5	6.0	26	
4	Reading, Total Means	English	28.7*	14.2	26	Sig. Diff. Var. 4 & 8
5	Reading Vocabulary	Spanish	13.2	5.4	12	
6	Reading Speed	Spanish	8.6	5.2	12	
7	Reading Comprehension	Spanish	14.8	7.1	12	
8	Reading, Total Means	Spanish	36.6*	16.5	12	Sig. Diff. Var. 4 & 8
9	Aural/Oral Comprehension	English	1.7**	.3	29	Sig. Diff. Var. 9 & 10
10	Aural/Oral Comprehension	Spanish	3.6**	.4	23	Sig. Diff. Var. 9 & 10
11	Writing	English	2.6*	.5	18	Sig. Diff. Var. 11 & 12
12	Writing	Spanish	3.0*	.8	18	Sig. Diff. Var. 11 & 12
13	Social Studies, All	Spanish/English	15.9**	3.9	22	Sig. Diff. Var. 13, Levels II & III
14	Social Studies, Span. Dominant	Spanish/English	16.9	2.3	11	
15	Science, All	Spanish/English	11.5**	4.0	20	Sig. Diff., Var. 15 & 16 NS, Var. 15, Lvl II & III
16	Science, Spanish Dominant	Spanish/English	8.7*	1.7	9	Sig. Diff., Var. 16, Levels II & III
17	Student Attitudes, Self	Spanish/English	3.4**	.4	21	Sig. Diff., Var. 18, 19, 21
18	Student Attitudes, Family	Spanish/English	2.7	.6	21	
19	Student Attitudes, School	Spanish/English	2.9	.4	21	
20	Student Attitudes, Community	Spanish/English	3.1*	.5	21	Sig. Diff., Var. 17
21	Student Attitudes, Total Means	Spanish/English	3.0	.3	21	
22	Culture, English Dominant	Spanish/English	24.0	3.5	3	Small N
23	Culture, Spanish Dominant	Spanish/English	23.8	4.9	19	
24	Culture, All	Spanish/English	23.7**	4.3	22	Sig. Diff. Var. 24 Level III and Var. 25, Level II

* $p = < .05$
** $p = < .01$

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TABLE 4

INSTRUCTIONAL VARIABLES TESTED IN SPANISH AND ENGLISH
High School: Grades 10-12 (Level IV)

Variable Number	Variable Description	Language	Mean	Std. Dev.	No. St.	Comment
1	Reading Vocabulary	English	12.1	6.3	19	
2	Reading Speed	English	5.4	3.6	19	
3	Reading Comprehension	English	13.8	6.1	19	
4	Reading, Total Means	English	31.3*	14.9	19	Sig. Diff. Var. 4 & 8
5	Reading Vocabulary	Spanish	16.7	7.0	17	
6	Reading Speed	Spanish	9.8	4.8	17	
7	Reading Comprehension	Spanish	15.9	5.7	17	
8	Reading Total Means	Spanish	42.4*	14.7	17	Sig. Diff. Var. 4 & 8
9	Aural-Oral Comprehension	English	2.2**	0.6	20	Sig. Diff. Var. 9 & 10
10	Aural-Oral Comprehension	Spanish	3.6**	1.0	20	Sig. Diff. Var. 9 & 10
11	Writing	English	2.8	.8	18	NS, Var. 11 & 12
12	Writing	Spanish	3.2	.8	18	NS, Var. 11 & 12
13	Social Studies, All	Spanish/English	17.0	4.0	19	NS Var. 13, Lvl III & IV
14	Social Studies, Eng. Dominant	Spanish/English	17.3	4.4	4	NS Var. 14 & 15
15	Social Studies, Span. Dominant	Spanish/English	16.9	4.0	15	NS Var. 14 & 15
16	Science, All	Spanish/English	16.8**	3.4	19	Sig. Diff. Var. 16, Levels III & IV
17	Science, English Dominant	Spanish/English	17.5	3.7	4	
18	Science, Spanish Dominant	Spanish/English	16.7**	3.5	15	Sig. Diff. Var. 18, Levels III & IV
19	Student Attitudes, Self	Spanish/English	3.5**	.5	19	SD Var. 20, 21, 22, 23
20	Student Attitudes, Family	Spanish/English	2.8	.6	19	
21	Student Attitudes, School	Spanish/English	3.1	.5	19	
22	Student Attitudes, Community	Spanish/English	3.0	.9	19	
23	Student Attitudes, Total Means	Spanish/English	3.1	.4	18	
24	Culture, English Dominant	Spanish/English	26.5	.0	2	
25	Culture, Spanish Dominant	Spanish/English	26.6	3.3	13	
26	Culture, All	Spanish/English	26.6*	3.1	15	Sig. Diff. Var. 26 Lvl IV and Var. 24, Lvl III

* $p = < .05$
** $p = < .01$

TABLE 5

SIGNIFICANT CORRELATIONS BETWEEN MEANS
OF INSTRUCTIONAL AND ATTITUDINAL VARIABLES TESTED IN SPANISH AND ENGLISH
Primary: Grades 1-3 (Level I)

Variable Numbers X	Y	Variable Descriptors X	Y	r Correlation	N df=N-2	p less than	Comment
3	1	Rdg. Vocab., E.	Rdg. Comp., E.	.63	41	.01	
4	1	Rdg. Total, E.	Rdg. Comp., E.	.89	43	.01	
4	2	Rdg. Total, E.	Rdg. Speed, E.	.56	20	.01	
4	3	Rdg. Total, E.	Rdg. Vocab., E.	.76	41	.01	
7	1	Rdg. Vocab., S.	Rdg. Comp., E.	.57	25	.01	
7	3	Rdg. Vocab., S.	Rdg. Vocab., E.	.70	24	.01	
7	4	Rdg. Vocab., S.	Rdg. Total, E.	.61	25	.01	
7	5	Rdg. Vocab., S.	Rdg. Comp., S.	.51	34	.01	
8	1	Rdg. Total, S.	Rdg. Comp., E.	.58	25	.01	
8	3	Rdg. Total, S.	Rdg. Vocab., E.	.51	24	.05	
8	4	Rdg. Total, S.	Rdg. Total, E.	.63	25	.01	
8	5	Rdg. Total, S.	Rdg. Comp., S.	.68	34	.01	
8	7	Rdg. Total, S.	Rdg. Vocab., S.	.89	34	.01	
10	8	A/O Comp., S.	Rdg. Total, S.	.41	32	.05	
13	4	Math Cmptn., R.S.	Rdg. Total, E.	.42	39	.05	
13	7	Math Cmptn., R.S.	Rdg. Vocab., S.	.36	13	.05	
13	11	Math Cmptn., R.S.	Writing, E.	.44	23	.05	
14	13	Math Gd. Lvl.	Math Cmptn., R.S.	1.00	45	.01	
15	7	St. Att. Self, S/E	Rdg. Vocab., S.	.37	31	.05	
15	9	St. Att. Self, S/E	A/O Comp., E.	.32	53	.05	
16	15	St. Att. Family, S/E	St. Att. Self, S/E	.70	53	.01	
17	13	St. Att. School, S/E	Math Cmptn., R.S.	.36	52	.01	
17	15	St. Att. School, S/E	St. Att. Self, S/E	.73	53	.01	
17	16	St. Att. School, S/E	St. Att. Family, S/E	.59	53	.01	
18	12	St. Att. Comm., S/E	Writing, S.	.44	24	.05	
18	15	St. Att. Comm., S/E	St. Att. Self, S/E	.57	53	.01	
18	16	St. Att. Comm., S/E	St. Att. Family, S/E	.69	53	.01	
18	17	St. Att. Comm., S/E	St. Att. School, S/E	.68	53	.01	
19	3	St. Att. Total, S/E	Rdg. Vocab., E.	.58	37	.01	

TABLE 5 (Continued)

Variable Numbers X	Y	Variable Descriptors X	Y	r Correlation	N df=N-2	p less than	Comment
19	7	St. Att. Total, S/E	Rdg. Vocab., S.	.55	31	.01	
19	15	St. Att. Total, S/E	St. Att. Self, S/E	.50	53	.01	
19	16	St. Att. Total, S/E	St. Att. Family, S/E	.48	53	.01	
19	17	St. Att. Total, S/E	St. Att. School, S/E	.45	53	.01	
20/21	1	Cultr, S.D./All, S/E	Rdg. Comp., E.	.31	41	.05	
20/21	3	Cultr, S.D./All, S/E	Rdg. Vocab., E.	.35	39	.05	
20/21	4	Cultr, S.D./All, S/E	Rdg. Total, E.	.38	41	.05	
20/21	7	Cultr, S.D./All, S/E	Rdg. Vocab., S.	.41	32	.05	
20/21	13	Cultr, S.D./All, S/E	Math Cmptn., R.S.	.40	54	.01	
20/21	15	Cultr, S.D./All, S/E	St. Att. Self, S/E	.40	53	.01	
20/21	17	Cultr, S.D./All, S/E	St. Att. School, S/E	.42	53	.01	

TABLE 6

SIGNIFICANT CORRELATIONS BETWEEN MEANS
OF INSTRUCTIONAL VARIABLES TESTED IN SPANISH AND ENGLISH
Intermediate: Grades 4-6 (Level II)

Variable Numbers X	Y	Variable Descriptors X	Y	r Correlation	N df=N-2	p less than	Comment
2	1	Rdg. Speed, E.	Rdg. Vocab., E.	.72	23	.01	
3	1	Rdg. Comp., E.	Rdg. Vocab., E.	.78	25	.01	
3	2	Rdg. Comp., E.	Rdg. Speed, E.	.44	23	.05	
4	1	Rdg. Total, E.	Rdg. Vocab., E.	.96	25	.01	
4	2	Rdg. Total, E.	Rdg. Speed, E.	.79	23	.01	
4	3	Rdg. Total, E.	Rdg. Comp., E.	.88	25	.01	
5	1	Rdg. Vocab., S.	Rdg. Vocab., E.	.60	20	.01	
5	2	Rdg. Vocab., S.	Rdg. Speed, E.	.68	19	.01	
5	4	Rdg. Vocab., S.	Rdg. Total, E.	.56	20	.05	
6	2	Rdg. Speed, S.	Rdg. Speed, E.	.68	18	.01	
6	5	Rdg. Speed, S.	Rdg. Vocab., S.	.84	20	.01	
7	2	Rdg. Comp., S.	Rdg. Speed, E.	.65	17	.01	
7	4	Rdg. Comp., S.	Rdg. Total, E.	.50	17	.05	
7	5	Rdg. Comp., S.	Rdg. Vocab., S.	.77	18	.01	
7	6	Rdg. Comp., S.	Rdg. Speed, S.	.81	17	.01	
8	1	Rdg. Total, S.	Rdg. Vocab., E.	.72	20	.05	
8	2	Rdg. Total, S.	Rdg. Speed, E.	.72	19	.01	
8	4	Rdg. Total, S.	Rdg. Total, E.	.54	20	.05	
8	5	Rdg. Total, S.	Rdg. Vocab., S.	.91	21	.01	
8	6	Rdg. Total, S.	Rdg. Speed, S.	.92	20	.01	
8	7	Rdg. Total, S.	Rdg. Comp., S.	.95	18	.01	
11	7	Writing, E.	Reading Comp., S.	.53	17	.01	
11	9	Writing, E.	A/O Comp., E.	.57	22	.01	
12	9	Writing, S.	A/O Comp., E.	.45	25	.05	
12	10	Writing, S.	A/O Comp., S.	.66	25	.01	
12	11	Writing, S.	Writing, S.	.60	22	.01	
13	8	Soc. St. All, S/E	A/O Comp., E.	.45	25	.05	
13	12	Soc. St. All, S/E	Writing, S.	.46	25	.05	
14	12	Soc. St. S.D., S/E	Writing, S.	.48	25	.05	
14	13	Soc. St. S.D., S/E	Soc. St. All, S/E	.80	25	.01	

TABLE 6 (Continued)

Variable Numbers X	Y	Variable Descriptors X	Y	r Correlation	N df=N-2	2 less than	Comment
15	10	Science, All, S/E	A/O Comp., S.	.43	26	.05	
15	11	Science, All, S/E	Writing, E.	.42	22	.05	
15	12	Science, All, S/E	Writing, S.	.57	25	.01	
15	13	Science, All, S/E	Soc. St. All, S/E	.60	25	.01	
16	10	Science, S.D., S/E	A/O Comp., S.	.43	26	.05	
16	11	Science, S.D., S/E	Writing, E.	.42	22	.05	
16	12	Science, S.D., S/E	Writing, S.	.57	25	.01	
16	13	Science, S.D., S/E	Soc. St., All, S/E,	.60	25	.01	
17	7	Math Cmptn., R.S.	Rdg. Comp., S.	.92	5	.05	Low N
18	7	Math Gr Lvl	Rdg. Comp., S.	.93	6	.05	Low N
18	17	Math Gr Lvl	Math Cmptn., R.S.	.99	9	.01	Low N
19	5	St. Att. Self, S/E	Rdg. Vocab., S.	.56	19	.05	
19	6	St. Att. Self, S/E	Rdg. Speed, S.	.59	18	.05	
19	8	St. Att. Self, S/E	Rdg. Total, S.	.55	19	.05	
20	15	St. Att. Family, S/E	Science, All, S/E	.43	22	.05	
20	16	St. Att. Family, S/E	Science, S.D., S/E	.43	22	.05	
21	1	St. Att. School, S/E	Rdg. Vocab., E.	.46	22	.05	
21	4	St. Att. School, S/E	Rdg. Total, E.	.47	22	.05	
21	5	St. Att. School, S/E	Rdg. Vocab., S.	.48	19	.05	
21	9	St. Att. School, S/E	A/O Comp., E.	.62	22	.01	
21	20	St. Att. School, S/E	St. Att. Family, S/E	.58	22	.01	
22	1	St. Att. Comm., S/E	Rdg. Vocab., E.	.38	22	.05	
22	4	St. Att. Comm., S/E	Rdg. Total, E.	.46	22	.05	
22	20	St. Att. Comm., S/E	St. Att. Family, S/E	.52	22	.05	
22	21	St. Att. Comm., S/E	St. Att. School, S/E	.76	22	.01	
23	15	St. Att. Mean, S/E	Science, All, S/E	.43	22	.05	
23	16	St. Att. Mean, S/E	Science, All, S/E	.43	22	.05	
23	19	St. Att. Mean, S/E	St. Att. Self, S/E	.47	22	.05	
23	20	St. Att. Mean, S/E	St. Att. Family, S/E	.81	22	.01	
23	21	St. Att. Mean, S/E	St. Att. School, S/E	.85	22	.01	
23	22	St. Att. Mean, S/E	St. Att. Comm., S/E	.74	22	.01	
24	6	Culture, S.D., S/E	Rdg. Speed, S.	.52	18	.05	
24	17	Culture, S.D., S/E	Math Cmptn., R.S.	.81	7	.05	
25	6	Culture, All, S/E	Rdg. Speed, S.	.52	18	.05	
25	17	Culture, All, S/E	Math Cmptn., R.S.	.81	7	.05	

TABLE 7

SIGNIFICANT CORRELATIONS BETWEEN MEANS
OF INSTRUCTIONAL AND ATTITUDINAL VARIABLES TESTED IN SPANISH AND ENGLISH
Junior High: Grades 7-9 (Level III)

Variable Numbers X	Y	Variable Descriptors X	Y	r Correlation	N df=N-2	p less than	Comment
2	1	Rdg. Speed, E.	Rdg. Vocab., E.	.73	26	.01	
3	1	Rdg. Comp., E.	Rdg. Vocab., E.	.60	26	.01	
3	2	Rdg. Comp., E.	Rdg. Speed, E.	.65	26	.01	
4	1	Rdg. Total, E.	Rdg. Vocab., E.	.90	26	.01	
4	2	Rdg. Total, E.	Rdg. Speed, E.	.87	26	.01	
4	3	Rdg. Total, E.	Rdg. Comp., E.	.88	26	.01	
5	1	Rdg. Vocab., S.	Rdg. Vocab., E.	.88	12	.01	
5	2	Rdg. Vocab., S.	Rdg. Speed, E.	.86	12	.01	
5	3	Rdg. Vocab., S.	Rdg. Comp., E.	.67	12	.05	
5	4	Rdg. Vocab., S.	Rdg. Total, E.	.87	12	.01	
6	1	Rdg. Speed, S.	Rdg. Vocab., E.	.84	12	.01	
6	2	Rdg. Speed, S.	Rdg. Speed, E.	.76	12	.01	
6	4	Rdg. Speed, S.	Rdg. Total, E.	.79	12	.01	
6	5	Rdg. Speed, S.	Rdg. Vocab., S.	.85	12	.01	
7	1	Rdg. Comp., S.	Rdg. Vocab., E.	.81	12	.01	
7	2	Rdg. Comp., S.	Rdg. Speed, E.	.79	12	.01	
7	3	Rdg. Comp., S.	Rdg. Comp., E.	.85	12	.01	
7	4	Rdg. Comp., S.	Rdg. Total, E.	.89	12	.01	
7	5	Rdg. Comp., S.	Rdg. Vocab., S.	.75	12	.01	
7	6	Rdg. Comp., S.	Rdg. Speed, S.	.79	12	.01	
8	1	Rdg. Total, S.	Rdg. Vocab., E.	.90	12	.01	
8	2	Rdg. Total, S.	Rdg. Speed, E.	.86	12	.01	
8	3	Rdg. Total, S.	Rdg. Comp., E.	.77	12	.01	
8	4	Rdg. Total, S.	Rdg. Total, E.	.92	12	.01	
8	5	Rdg. Total, S.	Rdg. Vocab., S.	.92	12	.01	
8	6	Rdg. Total, S.	Rdg. Speed, S.	.94	12	.01	
8	7	Rdg. Total, S.	Rdg. Comp., S.	.93	12	.01	
10	3	A/O Comp., S.	Rdg. Comp., E.	.44	20	.05	
10	4	A/O Comp., S.	Rdg. Total, E.	.47	20	.05	
10	7	A/O Comp., S.	Rdg. Comp., S.	.76	9	.05	
10	8	A/O Comp., S.	Rdg. Total, S.	.79	9	.05	

TABLE 7 (Continued)

Variable Numbers X	Y	Variable Descriptors X	Y	r Correlation	N df=N-2	p less than	Comment
11	1	Writing, E.	Rdg. Vocab., E.	.60	15	.05	
11	4	Writing, E.	Rdg. Total, E.	.66	15	.01	
12	1	Writing, S.	Rdg. Vocab., E.	.71	15	.01	
12	2	Writing, S.	Rdg. Speed, E.	.61	15	.05	
12	4	Writing, S.	Rdg. Total, E.	.65	15	.01	
12	11	Writing, S.	Writing, E.	.70	16	.01	
15	12	Science, All, S/E	Writing, S.	.62	13	.05	
16	12	Science, S.D., S/E	Writing, S.	.97	4	.05	Low N
17	2	St. Att. Self, S/E	Rdg. Speed, E.	.49	18	.05	
17	12	St. Att. Self, S/E	Writing, S.	.84	14	.05	
19	2	St. Att. School, S/E	Rdg. Speed, E.	.48	18	.05	
19	18	St. Att. School, S/E	St. Att. Family, S/E	.52	21	.05	
20	11	St. Att. Comm., S/E	Writing, E.	.55	14	.05	
21	17	St. Att. Mean, S/E	St. Att. Self, S/E	.60	21	.01	
21	18	St. Att. Mean, S/E	St. Att. Family, S/E	.76	21	.01	
21	19	St. Att. Mean, S/E	St. Att. School, S/E	.70	21	.01	
21	20	St. Att. Mean, S/E	St. Att. Comm., S/E	.59	21	.01	
23	1	Culture, S.D., S/E	Rdg. Vocab., E.	.56	16	.05	
23	2	Culture, S.D., S/E	Rdg. Speed, E.	.58	16	.05	
23	3	Culture, S.D., S/E	Rdg. Comp., E.	.62	16	.05	
23	4	Culture, S.D., S/E	Rdg. Total, E.	.64	16	.01	
23	5	Culture, S.D., S/E	Rdg. Vocab., S.	.88	9	.01	
23	6	Culture, S.D., S/E	Rdg. Speed, S.	.67	9	.05	
23	7	Culture, S.D., S/E	Rdg. Comp., S.	.75	9	.05	
23	8	Culture, S.D., S/E	Rdg. Total, S.	.81	9	.05	
23	10	Culture, S.D., S/E	A/O Comp., S.	.71	15	.01	
23	13	Culture, S.D., S/E	Soc. St. All, S/E	.50	15	.05	
24	1	Culture, All, S/E	Rdg. Vocab., E.	.57	21	.01	
24	2	Culture, All, S/E	Rdg. Speed, E.	.60	21	.01	
24	3	Culture, All, S/E	Rdg. Comp., E.	.55	21	.01	
24	4	Culture, All, S/E	Rdg. Total, E.	.65	21	.01	
24	5	Culture, All, S/E	Rdg. Vocab., S.	.87	12	.01	
24	6	Culture, All, S/E	Rdg. Speed, S.	.68	12	.05	
24	7	Culture, All, S/E	Rdg. Comp., S.	.74	12	.01	
24	8	Culture, All, S/E	Rdg. Total, S.	.82	12	.01	
24	10	Culture, All, S/E	A/O Comp., S.	.62	18	.01	
24	13	Culture, All, S/E	Soc. St. All, S/E	.52	17	.05	

TABLE 8

SIGNIFICANT CORRELATIONS BETWEEN MEANS
OF INSTRUCTIONAL AND ATTITUDINAL VARIABLES TESTED IN SPANISH AND ENGLISH
High School: Grades 10-12 (Level IV)

Variable Numbers X	Y	Variable Descriptors X	Y	r Correlation	N df=N-2	p less than	Comment
2	1	Rdg. Speed, E.	Rdg. Vocab., E.	.77	19	.01	
3	1	Rdg. Comp., E.	Rdg. Vocab., E.	.81	19	.01	
3	2	Rdg. Comp., E.	Rdg. Speed, E.	.79	19	.01	
4	1	Rdg. Total, E.	Rdg. Vocab., E.	.94	19	.01	
4	2	Rdg. Total, E.	Rdg. Speed, E.	.89	19	.01	
4	3	Rdg. Total, E.	Rdg. Comp., E.	.94	19	.01	
5	1	Rdg. Vocab., S.	Rdg. Vocab., E.	.70	17	.01	
5	3	Rdg. Vocab., S.	Rdg. Comp., E.	.49	17	.05	
5	4	Rdg. Vocab., S.	Rdg. Total, E.	.61	17	.01	
6	1	Rdg. Speed, S.	Rdg. Vocab., E.	.57	17	.05	
6	2	Rdg. Speed, S.	Rdg. Speed, E.	.56	17	.05	
6	3	Rdg. Speed, S.	Rdg. Comp., E.	.52	17	.05	
6	4	Rdg. Speed, S.	Rdg. Total, E.	.59	17	.05	
6	5	Rdg. Speed, S.	Rdg. Vocab., S.	.67	17	.01	
7	1	Rdg. Comp., S.	Rdg. Vocab., E.	.50	17	.05	
7	2	Rdg. Comp., S.	Rdg. Speed, E.	.56	17	.05	
7	4	Rdg. Comp., S.	Rdg. Total, E.	.54	17	.05	
7	5	Rdg. Comp., S.	Rdg. Vocab., S.	.55	17	.05	
8	1	Rdg. Total, S.	Rdg. Vocab., E.	.72	17	.01	
8	2	Rdg. Total, S.	Rdg. Speed, E.	.63	17	.01	
8	3	Rdg. Total, S.	Rdg. Comp., E.	.57	17	.05	
8	4	Rdg. Total, S.	Rdg. Total, S.	.69	17	.01	
8	5	Rdg. Total, S.	Rdg. Vocab., S.	.91	17	.01	
8	6	Rdg. Total, S.	Rdg. Speed, S.	.80	17	.01	
8	7	Rdg. Total, S.	Rdg. Comp., S.	.78	17	.01	
10	7	A/O Comp., S.	Rdg. Comp., S.	.51	17	.05	
10	8	A/O Comp., S.	Rdg. Total, S.	.51	17	.05	
11	1	Writing, E.	Rdg. Vocab., E.	.55	18	.05	
11	2	Writing, E.	Rdg. Speed, E.	.61	18	.01	
11	3	Writing, E.	Rdg. Comp., E.	.49	18	.05	
11	4	Writing, E.	Rdg. Total, E.	.58	18	.05	

TABLE 8 (Continued)

Variable Numbers X	Y	Variable Descriptors X	Y	r Correlation	N df=N-2	p less than	Comment
11	6	Writing, E.	Rdg. Speed, S.	.52	17	.05	
11	8	Writing, E.	Rdg. Total, S.	.56	17	.05	
12	11	Writing, S.	Writing, E.	.61	18	.01	
13	1	Soc. St. All, S/E	Rdg. Vocab., E.	.73	19	.01	
13	2	Soc. St. All, S/E	Rdg. Speed, E.	.64	19	.01	
13	3	Soc. St. All, S/E	Rdg. Comp., E.	.55	19	.05	
13	4	Soc. St. All, S/E	Rdg. Total, E.	.68	19	.01	
13	5	Soc. St. All, S/E	Rdg. Vocab., S.	.76	17	.01	
13	6	Soc. St. All, S/E	Rdg. Speed, S.	.70	17	.01	
13	8	Soc. St. All, S/E	Rdg. Total, S.	.76	17	.01	
13	11	Soc. St. All, S/E	Writing, E.	.63	18	.01	
14	2	Soc. St. E.D., S/E	Rdg. Speed, E.	.97	4	.05	
14	6	Soc. St. E.D., S/E	Rdg. Speed, S.	.98	4	.05	
15	1	Soc. St. S.D., S/E	Rdg. Vocab., E.	.69	15	.01	
15	2	Soc. St. S.D., S/E	Rdg. Speed, E.	.54	15	.05	
15	4	Soc. St. S.D., S/E	Rdg. Total, E.	.62	15	.05	
15	5	Soc. St. S.D., S/E	Rdg. Vocab., S.	.79	13	.01	
15	6	Soc. St. S.D., S/E	Rdg. Speed, S.	.71	13	.01	
15	8	Soc. St. S.D., S/E	Rdg. Total, S.	.81	13	.01	
15	11	Soc. St. S.D., S/E	Writing, E.	.63	14	.05	
16	1	Science All, S/E	Rdg. Vocab., E.	.69	19	.01	
16	2	Science All, S/E	Rdg. Speed, E.	.75	19	.01	
16	3	Science All, S/E	Rdg. Comp., E.	.68	19	.01	
16	4	Science All, S/E	Rdg. Total, T.	.75	19	.01	
16	5	Science All, S/E	Rdg. Vocab., S.	.73	17	.01	
16	7	Science All, S/E	Rdg. Comp., S.	.54	17	.05	
16	8	Science All, S/E	Rdg. Total, S.	.81	17	.01	
16	11	Science All, S/E	Writing, E.	.65	18	.01	
16	13	Science All, S/E	Soc. St. All, S/E	.78	19	.01	
16	15	Science All, S/E	Soc. St. S.D., S/E	.75	15	.01	
17	1	Science, E.D., S/E	Rdg. Vocab., E.	.95	4	.05	
17	2	Science, E.D., S/E	Rdg. Speed, E.	.97	4	.05	
17	3	Science, E.D., S/E	Rdg. Comp., E.	.99	4	.05	
17	4	Science, E.D., S/E	Rdg. Total, E.	.98	4	.05	

TABLE 8 (Continued)

Variable Numbers X	Y	Variable Descriptors X	Y	r Correlation	N df=N-2	p less than	Comment
18	1	Science, S.D., S/E	Rdg. Vocab., E.	.63	15	.05	
18	2	Science, S.D., S/E	Rdg. Speed, E.	.69	15	.01	
18	3	Science, S.D., S/E	Rdg. Comp., E.	.57	15	.05	
18	4	Science, S.D., S/E	Rdg. Total, E.	.70	15	.01	
18	5	Science, S.D., S/E	Rdg. Vocab., S.	.74	13	.01	
18	6	Science, S.D., S/E	Rdg. Speed, S.	.86	13	.01	
18	7	Science, S.D., S/E	Rdg. Comp., S.	.70	13	.01	
18	8	Science, S.D., S/E	Rdg. Total, S.	.89	13	.01	
18	11	Science, S.D., S/E	Writing, E.	.58	14	.01	
18	13	Science, S.D., S/E	Soc. St. All, S/E	.75	15	.01	
19	1	St. Att. Self, S/E	Rdg. Vocab., E.	.53	18	.05	
19	4	St. Att. Self, S/E	Rdg. Total, E.	.49	18	.05	
19	11	St. Att. Self, S/E	Writing, E.	.56	17	.05	
19	17	St. Att. Self, S/E	Science E.D., S/E	.96	4	.05	
21	1	St. Att. School, S/E	Rdg. Vocab., E.	.69	18	.01	
21	2	St. Att. School, S/E	Rdg. Speed, E.	.71	18	.01	
21	3	St. Att. School, S/E	Rdg. Comp., E.	.71	18	.01	
21	4	St. Att. School, S/E	Rdg. Total, E.	.75	18	.01	
21	13	St. Att. School, S/E	Soc. St. All	.49	18	.05	
21	15	St. Att. School, S/E	Soc. St., S.D., S/E	.56	14	.05	
21	16	St. Att. School, S/E	Science All, S/E	.59	18	.01	
21	18	St. Att. School, S/E	Science, S.D., S/E	.56	14	.05	
23	3	St. Att. Mean, S/E	Rdg. Comp., E.	.49	17	.05	
23	15	St. Att. Mean, S/E	Soc. St. S.D., S/E	.68	13	.05	
23	19	St. Att. Mean, S/E	St. Att. Self, S/E	.51	18	.05	
23	20	St. Att. Mean, S/E	St. Att. Family, S/E	.78	18	.01	
23	21	St. Att. Mean, S/E	St. Att. School, S/E	.71	18	.01	
23	22	St. Att. Mean, S/E	St. Att. Comm., S/E	.52	18	.05	
25	8	Culture, S.D., S/E	Rdg. Total, S.	.67	10	.05	
25	11	Culture, S.D., S/E	Writing, E.	.64	11	.05	
26	6	Culture All, S/E	Rdg. Speed, S.	.59	12	.05	
26	7	Culture All, S/E	Rdg. Comp., S.	.62	12	.05	
26	8	Culture All, S/E	Rdg. Total, S.	.65	12	.05	
26	11	Culture All, S/E	Writing, E.	.58	13	.05	

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